TWIN STATE ENVIRONMENTAL CORP.
P.O. Box 711, St. Albans, VT 05478 • TEL: (802) 527-8144 FAX: (802) 527-0198

SITE INVESTIGATION REPORT
MIDDLEBURY MOBIL
MIDDLEBURY, VERMONT

MAY 6, 1993

960608

PREPARED FOR:

R.L. VALLEE, INC.
282 SOUTH MAIN STREET
ST. ALBANS, VERMONT

PREPARED BY:

TWIN STATE ENVIRONMENTAL CORPORATION
P.O. BOX 711
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Lackard's Mobil
Site Investigation Report

TABLE OF CONTENTS

1.0 Introduction

This report has been prepared to summarize the activities conducted and the findings generated in association with a subsurface evaluation conducted at the Lackard's Mobil site (SMS site no. 90-0608) located on U.S. Route 7 in Middlebury, Vermont. The activities discussed were conducted in accordance with the Work Plan prepared for the site by NEIM and approved by the SMS.

Please note that although this project was initiated by NEIM, this report and the majority of the tasks described were conducted by Twin State Environmental Corporation (TSEC). Furthermore, the individuals involved with the project remained constant throughout it's implementation. All future correspondence related to this site should be forwarded to TSEC.

2.0 Site Background

This evaluation stems from the release of gasoline at this location which was discovered during underground storage tank (UST) removal activities conducted in August 1992. These activities were initiated to remove three (3) gasoline USTs, however upon excavation of the UST area it was determined that six (6) USTs were actually present. At this time it additionally became evident that a release had occurred from one (1) or more of the tank systems, as soils within the area of excavation were found by Photoionization Detector (PID) screening to exhibit elevated levels of organic vapors.

As a result of these findings, the following actions were initiated:

- All six (6) USTs were removed from the ground and inspected for holes. The tank pull form submitted by Owen Fernald, (formerly of Twin State Environmental) indicates one (1) tank was in "terrible" condition with holes, two (2) tanks were in fair condition, two (2) tanks were in good condition and one (1) tank was noted as in excwellent condition.

- Upon authorization from the Vermont Agency of Natural Resources, Sites Management Section (SMS) Approximately 350 cubic yards of petroleum contaminated soil was excavated, removed from the site and transported to the Georgia Mobil site in Georgia, VT. These soils were stockpiled and polyencapsulated at this Georgia location, where they currently remain.

  Note that the status of these soils will not be addressed in this report, but rather in a separate report dedicated to the stockpiled soils which are currently under active remediation at the Georgia Mobil site.

- Two (2) monitoring wells (MW-1 and MW-2) and several soil borings were installed within the vicinity of the UST excavation. Drilling at each location included visual and PID screening of subsurface soils for the identification of petroleum contamination. These locations, which are identified on Figure 1, did not reveal the presence of contamination.

- The base and sidewalls of the excavated area were surveyed with the use of a PID. This survey revealed organic vapor concentrations ranging between 240 and 300 parts per million (ppm). The highest readings encountered were those collected in the south and east areas of the excavation.

- Several areas identified as likely receptors of gasoline vapors were surveyed for contamination with the use of a PID. Areas investigated in this manner include: several storm and sewer manways located along Route 7 and Elm Street and a crawl space below the Lackard's Mobil building. No detectable PID readings were reported as encountered in any of these investigated areas.

- Following discussions with the SMS, a vapor extraction system was installed within the excavation concurrently with two (2) replacement USTs. This vapor extraction system has been in intermittent operation since October 19, 1992 and is subject to weekly monitoring and monthly reporting requirements. For a detailed description of this remediation system or for a summary of the monitoring results, the reader is referred to the initial and subsequent monthly status reports which have been submitted to the SMS.

The tasks conducted in association with the current phase of site evaluation, were designed to expand upon data generated by the above noted tasks. These tasks are discussed throughout Section 4.0 below.

3.0 Site Setting and Layout

The Site Plan provided as Figure 1 identifies the current site layout and additionally illustrates the locations of the former USTs. Note that the area identified as FUST-1 contained four (4) gasoline USTs including two (2) with a 3,000 gallon capacity and two (2) with a capacity of 1,000 gallons. The area identified as FUST -2 contained two (2) USTs with reported capacities of 4,000 and 10,000 gallons. Both of these USTs were previously used for gaswoline storage.

Currently this site consists of: one (1) building which is used as a convenience store; and gasoline storage and distribution

facilities, including two (2) 10,000 gallon USTs and associated pumps. The existing USTs are located on the south side of the site, adjacent to Elm Street. Virtually the entire site is paved, and a gradual slope to the south is evident.

The Site Location Map (Figure 2) illustrates the proximity of the site to several surrounding buildings and the Otter Creek located approximately 1700 feet to the west. Property use within the vicinity of the site includes a mix of single and multi-family housing, office space and commercial/light industrial uses. Areas immediately adjacent to this site include multi-family houses to the north and north west; an ambulance garage and associated office space to the west, office space in a converted house to the south, on the opposite side of Elm Street; and across Route 7 to the east is an inn.

Municipal water and sewer services are provided to the site and the surrounding properties. Sewer lines identified in the vicinity of the site are located along Route 7 and Elm Street. This is evidenced by the presence of storm drains and sewer manways. The exact locations of water lines are not accurately known, however water and other utility lines are believed to be present within a former drywell located on the west side of the site building.

The soil vapor extraction system which was installed in conjunction with the UST removals is located along the northern side of the property. The aboveground components of this system include a shed and two (2) carbon vessels. Underground PVC piping transports vapors from each of the two (2) former UST areas to the system for remediation. The approximate layout of this system is depicted in the Schematic Drawing provided as Figure 3.

4.0 Summary of Project Activities

As stated in the project Work Plan, which was approved for implementation by the SMS on January 15, 1992, the objectives of this investigation were to evaluate what impact, if any, has been imposed as a result of the apparent petroleum release and to determine the need for further activities at the site, including the development of a detailed corrective action plan, and to ultimately address the need for a long-term treatment/monitoring plan.

In order to meet these objectives, the following activities were conducted in accordance with the current phase of site evaluation:

- Subsurface soils were screened for contamination at three (3) on-site locations;
- Three (3) monitoring wells were installed for the continual monitoring of groundwater underlying the site;
- The newly installed monitoring wells and the two (2) existing monitoring wells (MW-1 and MW-2) were surveyed

for location and elevation data. This data was incorporated in to the Site Plan;
- Accessible monitoring wells were sampled for groundwater data and analysis;
- Several potential receptors were surveyed for the presence of petroleum related contamination; and,
- The vapor extraction system was evaluated in terms of remedial efficiency.

The following sections have been prepared to discuss the implementation of these activities and the data generated as a result.

4.1 Monitoring Well/Soil Boring Installations

Subsurface soils were evaluated at three (3) on-site locations through the installation of soil borings. Following the evaluation of soils at these locations each soil boring was converted to a monitoring well. The approximate locations of these monitoring wells (MW-3, MW-4 and MW-5) as well as the previously installed monitoring wells (MW-1 and MW-2) are depicted on Figure 1.

The locations selected for these soil borings/monitoring wells are intended to compliment data generated by the previous site activities, and subsequently address data gaps associated with the site. The logic used to locate all on-site monitoring wells and the specific intention of each monitoring well is summarized as follows:

MW-1 was installed immediately following the tank excavation activities which resulted in the discovery of the petroleum contamination. This well was situated near the limits of the south east corner of the excavation which was reported to exhibit the highest organic vapor concentrations as determined by PID.

MW-2 was also installed shortly following the UST excavation activities. This well was installed in the area believed at the time to be hydraulically downgradient from the area of contamination.

Note that the depth of both MW-1 and MW-2 is approximately four (4) feet, which is insufficient for a continuously useable monitoring well at this location. Well logs for MW-1 and MW-2 are additionally provided in Appendix A.

MW-3 is located north and east of the areas of contamination. This well is intended to provide data representative of upgradient, off-site areas.

MW-4 is situated adjacent to the south east corner of the Lackard's Mobil store. Data generated by this well represents groundwater which is migrating off-site.

MW-5 was placed north of the pump island, in order to detect contamination which migrates along the conduit provided by the UST piping.

As proposed, the drilling of MW-3, MW-4 and MW-5 was conducted with the use of a truck-mounted drill rig equipped with solid augers. This drilling was conducted by Adams Engineering, Inc. under the direction of NEIM, Inc. on February 11, 1993. Screening of soils encountered at each location was conducted by NEIM through visual observations and PID readings.

Information provided on the Well Logs in Appendix A indicates the soil types encountered, PID readings recorded and the specifications of each well as constructed. Each well was constructed of solid 2 inch diameter PVC casing and 0.010 inch slot size screen and fitted with a flush mounted well guard. Each of these newly installed wells exceeds nine (9) feet in depth.

4.2 Well Survey

In order to generate information necessary for the periodic determination of groundwater flow relative to this site location, each monitoring well located at the site was surveyed for location and elevation data. This data has been incorporated into the Site Plan provided as Figure 1.

4.3 Groundwater Sampling

Groundwater sampling for the collection of data and analysis was conducted by NEIM, Inc. on February 18, 1993. Due however to relatively low water level elevations at the time of sampling, well numbers MW-1 and MW-2 could not be successfully sampled for analysis. This sampling event was therefore limited to the analysis of samples from MW-3, MW-4 and MW-5, and two (2) QA/QC samples including one (1) field blank and one (1) equipment blank.

In addition to the collection of samples for analysis, NEIM also collected PID readings, visual observations and water level data, where applicable.

The results of this sampling episode are presented in tabular form on Tables 1 and 2 and are discussed through out Section 5.0 below. The laboratory report for these analytical results is provided in Appendix B.

4.4 Risk Assessment

In order to address the potential that contamination may have migrated off-site and affected surrounding receptors, a survey of the surrounding area was conducted. Initially, this included an evaluation of groundwater flow and the most likely path(s) of migration applicable to contamination originating from the Lackard's Mobil site. As a result, several biased areas were selected for a PID evaluation in order to attempt identification of contamination.

Due to the interpreted direction of groundwater flow, and the presence of potential conduits for contamination migration (i.e. underground utilities and areas of fill or reworked material), several areas were prioritized for this assessment. Areas which were approached for evaluation in this manner include:

1. The basement of the closest residence, which is located immediately west of the Lackard's site;

2. The basement of the converted office building located south of the site, across from Elm Street; and,

3. The basement of the residence located further east on Elm Street (i.e. immediately east of the converted office building).

On April 2, 1993, TSEC conducted PID evaluations of the first two (2) areas listed above. Both surveys included the collection of PID data from throughout the accessible basement areas. An emphasis was placed on evaluating areas of foundation and floor cracks, floor drains, and pipes entering the basement areas.

TSEC returned to the site on April 6, 1993 and attempted to access the third area listed above for a similar evaluation. This building, however, was not accessible at this time and therefore not surveyed. While on site however the proximity of this building to the Lackard's site was reevaluated and it was determined to be of sufficient distance from the site to be an unlikely receptor. Furthermore, as discussed in Sections 5.1 and 5.2, MW-4, which is situated between this building and the Lackard's site, has been found by analysis to contain only an insignificant concentration of toluene (0.009 PPM as determined by EPA Method 8020). No other indications of contamination have ever been encountered within the vicinity of MW-4.

4.5 VES Evaluation

As periodically reported by NEIM and more recently by TSEC,

the vapor extraction system (VES), which was installed at this site to remediate subsurface soils, has been in continual operation (despite numerous shut-down periods) since October 19, 1992. The intention of this soil remediation system is to improve site conditions by drawing vapors from the two (2) contaminated former tank areas to the VES system for treatment prior to discharge to the atmosphere.

In order to ensure compliance with the discharge requirements imposed on this system, and subsequently, provide continual monitoring of the system, weekly site visits are conducted which involve the collection of PID readings from the various stages of the remediation system. The results of this monitoring data are summarized on a monthly basis and submitted to the SMS for review.

In conjunction with the objectives of this phase of evaluation, the VES has been evaluated in terms of it's effectiveness overall, and its anticipated ability to improve the condition of the site. The results of this evaluation is discussed in Section 5.4 below.

5.0 Results

This section has been prepared to present the results of data generated throughout the implementation of the tasks described above.

5.1 Soil Borings/Monitoring Wells

The initial drilling activities conducted at this site during August 1992, revealed no evidence of subsurface contamination. However, in order to further evaluate the site, subsurface soils were further evaluated at the three (3) biased locations selected for the installation of monitoring wells.

As indicated on the Well Logs, PID readings were detected during the installation of MW-3 and MW-5. No PID readings or petroleum odors however were detected during the installation of MW-4. At the location of MW-3, downhole PID readings of 30 PPM were detected at a depth of 2.5 feet. PID readings appeared to decrease with depth at this location, as a headspace PID reading of 5 PPM was detected of soils collected from a depth interval of 5 to 10 feet. The screening of soils at MW-5 revealed gasoline odors and an ambient PID reading of 5 PPM at a depth of approximately 4 feet. Soils collected from this depth which were subjected to headspace screening revealed a PID reading of 5 PPM.

5.2 Groundwater Sampling

Provided on Table 1 is a summary of the monitoring well field measurements collected by NEIM during the groundwater sampling aspect of this project. Data included in this summary are water level elevation data, PID readings collected in the well headspace, and visual observations, if any, reported by the sampler.

In addition, the water level elevation data has been translated into a groundwater contour map which illustrates the actual direction of groundwater flow at the time of sampling in the area underlying the site. This drawing which is provided as Figure 4 illustrates the flow of groundwater from north west to south east.

As discussed above, insufficient well volumes prohibited the collection of groundwater samples from well numbers MW-1 and MW-2. Therefore, this groundwater sampling event was limited to the analysis of samples collected from well numbers MW-3, MW-4 and MW-5 and the corresponding QA/QC samples, including one (1) field blank and one (1) equipment blank sample. The results generated by the analysis of these samples for purgeable aromatics by USEPA Method number 8020 are tabulated on Table 2 and the Laboratory report is provided in Appendix B.

As summarized, these results indicate that relatively low concentrations of total BTEX contamination was detected in each of the sampled wells. Reported concentrations of Total BTEX range from 9 ug/l in MW-4 to 1,554 ug/l in MW-5. MW-3 was found to contain a Total BTEX concentration of 42 ug/l.

A comparison of the individual components of the Total BTEX levels, reveals inconsistency in terms of the make-up of the identified contamination. Of the Total BTEX concentrations reported for each sample, MW-5 was found to contain the highest percentage of Benzene with this compound representing 50% of the sample's Total BTEX concentration. Total BTEX identified in MW-4 consisted exclusively of Toluene (i.e. Benzene, Ethylbenzene and Xylene were not detected), and MW-3 reported Total BTEX concentration consisting of 67% Xylene, and lesser portions of both Benzene and Toluene compounds (18% and 14% respectively).

As also summarized on Table 2, MTBE was only detected in MW-5. The reported concentration of MTBE in this well is

3,360 ug/l.

5.3 Risk Assessment

As discussed above, only two (2) of the three (3) building areas selected for PID evaluations were accessible for TSEC. These evaluations were conducted on April 2, 1993 in the basement areas of the following buildings:

1. The closest residence, which is located immediately west of the Lackard's site;

2. The converted office building located south of the site, across from Elm Street;

The implementation of these surveys was an attempt to identify petroleum vapors which may have migrated from the Lackard's site to surrounding basements. An emphasis was therefore placed on collecting PID data from likely points of migration into the basement areas, such as foundation cracks, floor drains and pipes entering the basement areas. In addition, PID readings were collected at unbiased and ambient locations through out each inspected area.

As a result of this survey, no positive readings were detected in any area investigated. Furthermore, no visual observations were made to indicate that petroleum contamination was present in any area surveyed.

5.4 VES Evaluation

A review of the PID monitoring results which have been collected throughout the operation of the VES system indicates that the influent concentrations have varied considerably. Several trends, however are distinguishable from the data generated to date. Identified trends include the following:

1. Influent concentrations from Line A have been consistently and considerably higher than influent concentration simultaneously detected at Line B.

   As illustrated in Figure 3, Line A provides the system vapors from the former UST area located in the south east corner of the site (FUST #1), and Line B flows from FUST #2 located to the north. Based on the initial contamination levels encountered in these areas during the August 1992 UST excavation

activities, contamination levels in both areas are expected to be similar. TSEC therefore does not have an explanation for the difference in influent concentrations, however, it is noted as a possibility that the B influent line could be blocked or otherwise minimizing the migration petroleum vapors. Unfortunately, unlike Line A, there are no vertical clean-out wells connected to the manifold system in Line B.

2. Despite apparently sporadic peaks in concentration levels, a declining trend in influent concentrations has been evident in both Line A and Line B since the start-up of the system.

3. The predictable detection of elevated influent concentrations following periods when the system was shut down, indicates the operation of the system has a net positive effect on the site contamination.

4. The most recent monitoring event, conducted on March 12, 1993, curiously revealed effluent concentrations which were higher than the influent concentrations of Line A and Line B combined. It is speculated by TSEC that the reason for this occurrence has to do with the situation of the effluent sample port after the moisture separator and the dual carbon vessels, combined with the fact that both of these portions of the VES are reservoirs for the contamination removed from incoming vapors.

Based on the continual monitoring of the VES and the trends identified above, TSEC believes the system is operating effectively and should remain in operation. Currently, as noted in the most recent VES status report dated April 5, 1993, the system has not been in operation since effluent concentrations were detected above the allowable discharge limit (5 ppm) thus indicating breakthrough had occurred.

Following replacement of the spent carbon (TSEC currently awaits approval to conduct this task), this system will be reactivated and continually monitored by TSEC.

6.0 Conclusions and Recommendations

Based on the data and findings generated by the current phase of

site evaluation, TSEC has developed the following conclusions relative to the Lackard's Mobil site:

- The identification of subsurface petroleum contamination resulted in the implementation of investigative and remedial activities at this site.

- Although both groundwater and subsurface soil contamination related to gasoline has been detected within several locations/areas of the site, the extent of contamination is not believed to be extensive. Furthermore, conclusive data or observations have not been developed which indicates contamination has migrated off site.

- No potential receptors of contamination within the immediate vicinity of the site are believed to be at risk of contamination.

- The vapor extraction system which has been in operation at the site since October 1992 appears to have a positive effect on the site's subsurface soil contamination. Monitoring of this system has revealed a general decline in influent concentrations since the system was initially started.

As a result of these conclusions, TSEC recommends the following activities be conducted in conjunction with this site:

- The vapor extraction system should be restarted once the saturated carbon has been replaced and the contents of the moisture trap removed for appropriate disposal.

- Once in operation, Line B of the VES should be evaluated for the potential of blockage. TSEC proposes to accomplish this by running a sewer "snake" from the remediation shed back through the manifold system.

- Continue to monitor the VES system on a weekly basis and submit monthly monitoring reports which include a re-evaluation of the VES to the SMS.

- Institute periodic groundwater monitoring at the site. TSEC recommends that this monitoring be initially conducted on a quarterly basis and include the collection of groundwater data and samples for Method 8020 analysis from all accessible monitoring wells. Occasionally, this sampling should be expanded to include the collection of water samples for analysis from the clean-out point (CO-1) of the VES. This additional data can be used to further evaluate the effectiveness of the VES system.

As appropriate, the quarterly monitoring reports submitted to the SMS should provide recommendations based on the development of new data.

TABLE 1
SUMMARY OF WATER LEVEL ELEVATION DATA
LACKARD'S MOBIL
MIDDLEBURY, VT
FEBRUARY 18, 1993

WELL NO.	MEASURED DEPTH TO WATER LEVEL (ft)	TOC ELEVATION (ft)	WATER LEVEL ELEVATION (ft)
MW-1	DRY	97.51	-
MW-2	DRY	96.91	-
MW-3	5.73	98.59	92.86
MW-4	6.35	96.66	90.31
MW-5	5.34	98.74	93.40

NOTES: . All water level data collected by NEIM Inc.
. All elevation Data is reported in feet relative to a temporary BENCHMARK utilized for the site survey
. Dry-indicates no measurable water was present in the identified well at the time of sampling
. Well locations are identified on Figure No. 1
. Toc-top of casing

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
GROUNDWATER SAMPLES
LACKARD'S MOBIL
MIDDLEBURY, VT

RESULTS (ug/l)

SAMPLE NO	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	TOTAL BTEX	MTBE
MW-1	NS	NS	NS	NS	-	NS
MW-2	NS	NS	NS	NS	-	NS
MW-3	7.7	5.9	ND	28.5	42	ND
MW-4	ND	9.4	ND	ND	9	ND
MW-5	781	22.3	214	537	1,554	3,360
EQUIP BLANK	ND	ND	ND	ND	-	ND
FIELD BLANK	ND	ND	ND	ND	-	ND

NOTES: . All samples collected by NEIM on February 18, 1993
. ND indicates identified parameter was not detected above the method detection limit
. NS indicates identified well was not sampled
. Well nos. MW-1 and MW-2 were dry at the time of sampling and therefore were not incorporated into this sampling event.
. All analysis conducted by Endyne, Inc. using USEPA METHOD 8020
. Well locations are identified on Figure No.1

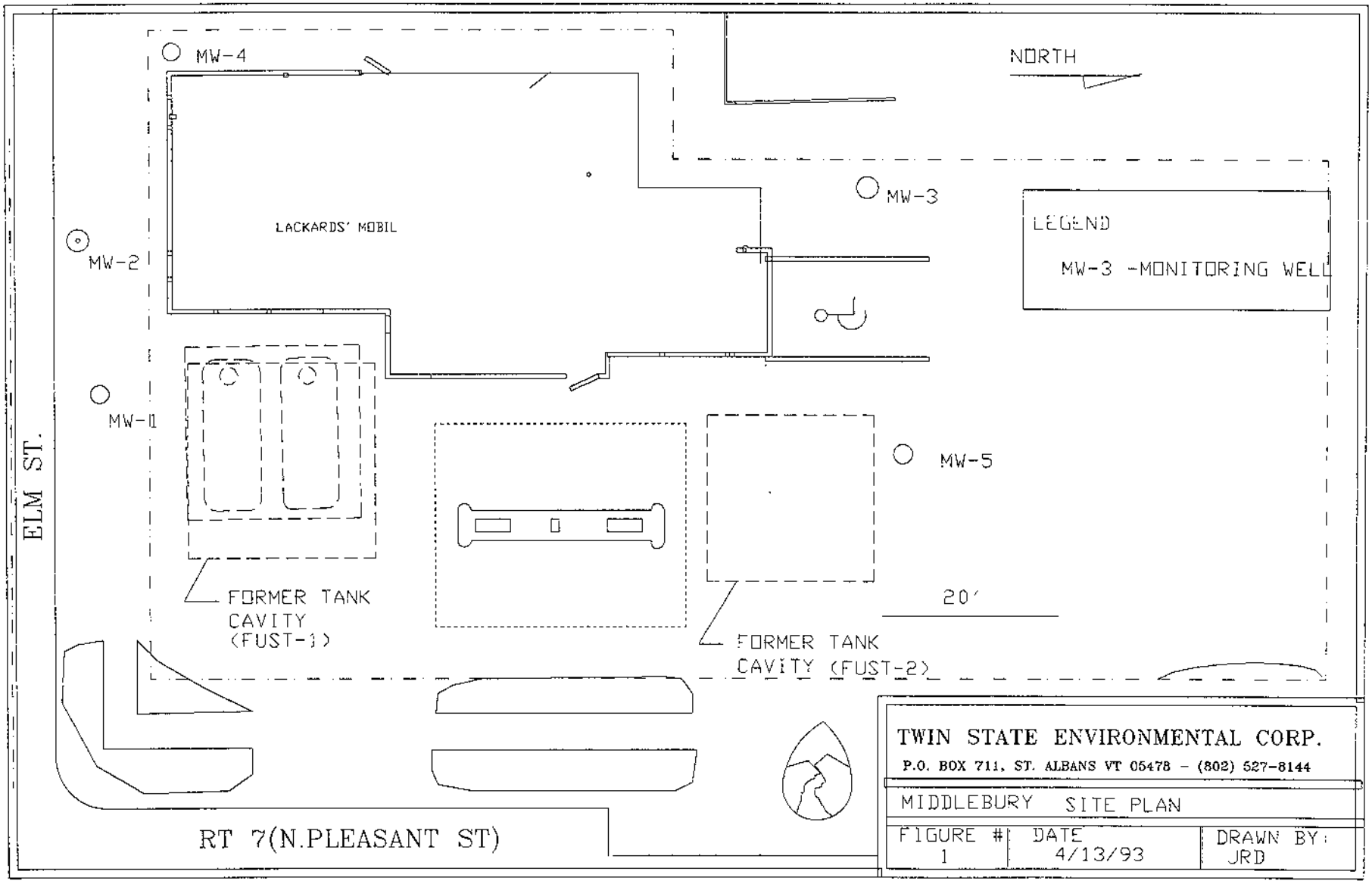
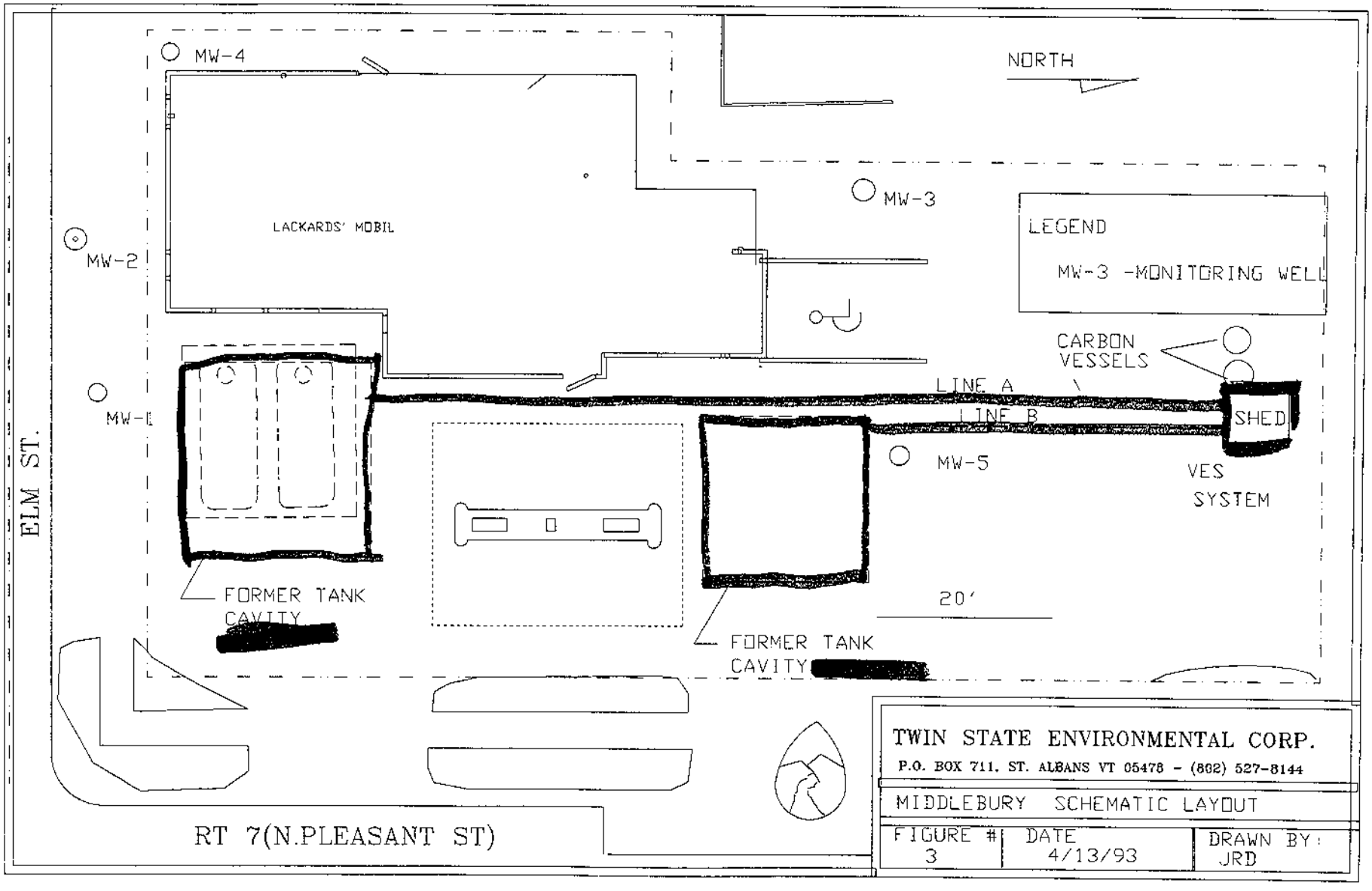
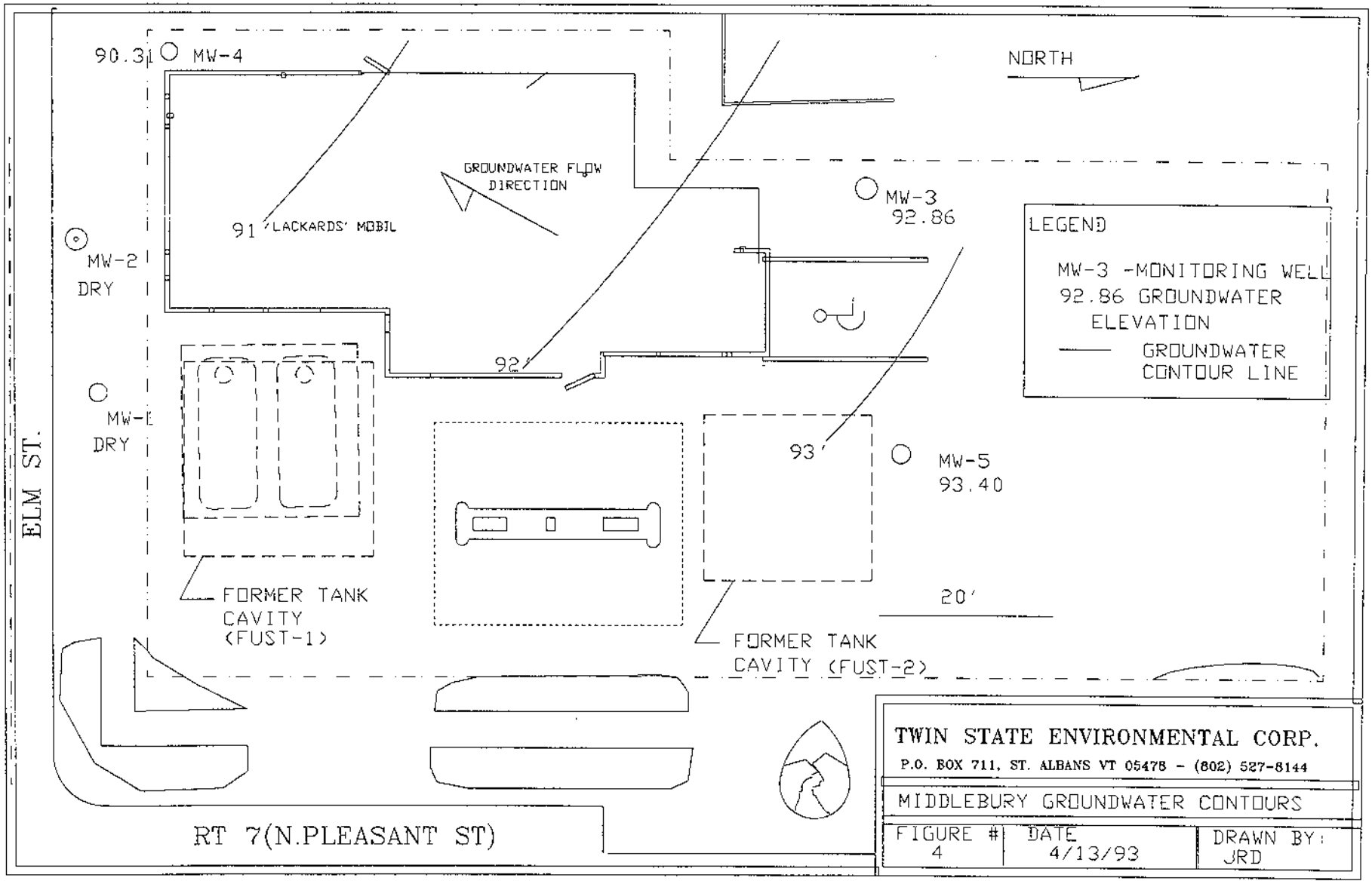

MW-4
NORTH
MW-3
LACKARDS' MOBIL
LEGEND
MW-3 -MONITORING WELL
MW-2
MW-1
MW-5
ELM ST.
FORMER TANK CAVITY (FUST-1)
20'
FORMER TANK CAVITY (FUST-2)
RT 7(N.PLEASANT ST)
TWIN STATE ENVIRONMENTAL CORP.
P.O. BOX 711, ST. ALBANS VT 05478 - (802) 527-8144
MIDDLEBURY SITE PLAN
FIGURE # 1
DATE 4/13/93
DRAWN BY: JRD

FIGURE 2

SITE LOCATION MAP
LACKARD'S MOBIL
MIDDLEBURY, VERMONT

SOURCE: USGS MIDDLEBURY, VT QUADRANGLE
SCALE 1:24000


MW-4
NORTH
MW-3
LACKARDS' MOBIL
MW-2
LEGEND
MW-3 -MONITORING WELL
CARBON VESSELS
LINE A
LINE B
SHED
MW-1
MW-5
VES SYSTEM
ELM ST.
FORMER TANK CAVITY
20'
FORMER TANK CAVITY
RT 7(N.PLEASANT ST)
TWIN STATE ENVIRONMENTAL CORP.
P.O. BOX 711, ST. ALBANS VT 05478 - (802) 527-8144
MIDDLEBURY SCHEMATIC LAYOUT
FIGURE # 3
DATE 4/13/93
DRAWN BY: JRD


90.31
MW-4
NORTH
GROUNDWATER FLOW DIRECTION
91
LACKARDS' MOBIL
MW-3
92.86
LEGEND
MW-3 -MONITORING WELL
92.86 GROUNDWATER ELEVATION
GROUNDWATER CONTOUR LINE
MW-2
DRY
92
MW-1
DRY
93
MW-5
93.40
ELM ST.
FORMER TANK CAVITY (FUST-1)
20'
FORMER TANK CAVITY (FUST-2)
RT 7(N.PLEASANT ST)
TWIN STATE ENVIRONMENTAL CORP.
P.O. BOX 711, ST. ALBANS VT 05478 - (802) 527-8144
MIDDLEBURY GROUNDWATER CONTOURS
FIGURE # 4
DATE 4/13/93
DRAWN BY: JRD

APPENDIX A

APPENDIX B

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993

PROJECT CODE: NEIM1267
REF.#: 42,426 - 42,430

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody.

Chain of custody did not indicate sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 3, 1993

PROJECT CODE: NEIM1267
REF.#: 42,426
STATION: MW-3
TIME SAMPLED: 12:15
SAMPLER: R. Swainbank

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	5	7.7
Chlorobenzene	5	ND[2]
1,2-Dichlorobenzene	5	ND
1,3-Dichlorobenzene	5	ND
1,4-Dichlorobenzene	5	ND
Ethylbenzene	5	ND
Toluene	5	5.9
Xylenes	5	28.5
MTBE	25	ND

Bromobenzene Surrogate Recovery: 107%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >25

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 20% dilution.

2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 2, 1993

PROJECT CODE: NEIM1267
REF.#: 42,430
STATION: MW-4
TIME SAMPLED: 12:20
SAMPLER: R. Swainbank

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	9.4
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 116%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 5

NOTES:
1 None detected

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 3, 1993

PROJECT CODE: NEIM1267
REF.#: 42,429
STATION: MW-5
TIME SAMPLED: 12:10
SAMPLER: R. Swainbank

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	5	781.
Chlorobenzene	5	ND[2]
1,2-Dichlorobenzene	5	ND
1,3-Dichlorobenzene	5	ND
1,4-Dichlorobenzene	5	ND
Ethylbenzene	5	214.
Toluene	5	22.3
Xylenes	5	537.
MTBE	25	3,360.

Bromobenzene Surrogate Recovery: 103%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >25

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 20% dilution.

2 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 3, 1993

PROJECT CODE: NEIM1267
REF.#: 42,428
STATION: Eq Blank
TIME SAMPLED: 12:05
SAMPLER: R. Swainbank

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 94%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

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FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 2, 1993

PROJECT CODE: NEIM1267
REF.#: 42,427
STATION: Field Blank
TIME SAMPLED: 12:00
SAMPLER: R. Swainbank

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	5	ND

Bromobenzene Surrogate Recovery: 93%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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FAX 879-7103

EPA METHOD 602 LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: NEIM
PROJECT NAME: Lackards Mobil
REPORT DATE: March 3, 1993
DATE SAMPLED: February 18, 1993
DATE RECEIVED: February 18, 1993
ANALYSIS DATE: March 2, 1993

PROJECT CODE: NEIM1267
REF.#: 42,427
STATION: Field Blank
TIME SAMPLED: 12:00
SAMPLER: R. Swainbank

Parameter	Sample(ug/L)	Spike(ug/L)	Dup1(ug/L)	Dup2(ug/L)	Avg % Rec
Benzene	0	10	10.8	11.7	113%
Toluene	0	10	10.6	11.2	109%
Ethylbenzene	0	10	10.4	11.1	107%
Xylenes	0	30	30.4	32.2	104%

ENDYNE, INC.

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CHAIN-OF-CUSTODY RECORD

9208.316 005680

Project Name: LACKARDS MOBIL Site Location: RT 7 Middlebury VT	Reporting Address: New England IND maint 76 ETHAN ALLEN Dr S. Burlington	Billing Address: SAME
Endyne Project Number: NCJM1267	Contact Name: John Dirgo Company/Phone #: NEIM 863-8714	Sampler Name: Randy Swiinbank Company/Phone #: SAME

Lab #	Sample Description	Matrix	Date/Time 2-18-93	Container No.	Container Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
92126	MW 3	H2O	1215	2	40 mL		8020	4°C	
92127	Field Blank	H2O	2-18-93 1200	1	40 mL				
92128	Equipment blank	H2O	1205	1	40 mL				
92129	MW 5	H2O	1210	2	40 mL				
92130	MW 4	H2O	1220	2	40 mL				

Relinquished by: Signature	Received by: Signature	Date/Time
Ral Swinbank	[illegible]	2/18/93 2:45 pm
Relinquished by: Signature	Received by: Signature	Date/Time

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals ICP/AA	21	EPA 624	26	EPA 8270
2	Chloride	7	Total P	12	TSS	17	Fecal and/or Tot.	22	EPA 625 B/N or A	27	EPA 8010
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8020
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB	29	EPA 8080
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240	30	EPTOX
31	TCLP (Specify: voltiles, semi-volatiles, metals, pesticides, herbicides)										
32	Other (Specify):										

LABORATORY: WHITE PROJECT MANAGER: YELLOW SAMPLER: PINK

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

9205316

005680

Project Name: LACKAROS MOBIL Site Location: RT 7 Middlebury VT	Reporting Address: NewEngland ENDO Maint 76 ETHAN ALLEN Dr S. Burlington	Billing Address: SAME
Endyne Project Number:	Contact Name: John Diggo Company/Phone #: NEEM 863-8714	Sampler Name: Randy Satterbeck Company/Phone #: SAME

Lab #	Sample Description	Matrix	Date/ Time	Container No.	Container Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	MW3	H_2O	1215	2	40mL		8020	4°C	
	Field Blank	H_2O	2-18-93 1200	1	40mL				
	Equipment blank	H_2O	1205	1	40mL				
	MW5	H_2O	1210	2	40mL				
	MW4	H_2O	1220	2	40mL				

Relinquished by: Signature Randy Satterbeck	Received by: Signature	Date/Time 2/18/93 2:45 PM
Relinquished by: Signature	Received by: Signature	Date/Time

Requested Analyses

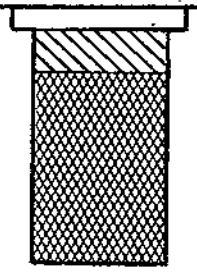
1	pH	6	TKN	11	Total Solids	16	Metals ICP/AA	21	EPA 624	26	EPA 8270
2	Chloride	7	Total P	12	TSS	17	Fecal and/or Tot.	22	EPA 625 B/N or A	27	EPA 8010
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8020
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB	29	EPA 8080
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240	30	EPTOX
31	TCLP (Specify: voltiles, semi-volatiles, metals, pesticides, herbicides)										
32	Other (Specify):										

LABORATORY: WHITE PROJECT MANAGER: YELLOW SAMPLER: PINK

WELL LOG

PROJECT NAME: Lackard's Mobil
LOCATION: MIDDLEBURY, VT
DATE DRILLED: August 20, 1992
TOTAL DEPTH OF HOLE: 3.8'
SCREEN DIA.: 1.5 INCH LENGTH: 3.0'
CASING DIA.: 1.5 INCH LENGTH: 0.6'
DRILLING CO.: ADAMS ENGINEERING
DRILLER: Gerry Adams

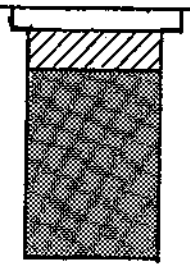
WELL NO.: MW-1
PROJECT NO.: 93-006
DRILL DIA.: 2.375"
SLOT SIZE: 0.006"
TYPE: PVC
DRILLING METHOD: Vibrating Core
LOGGED BY: J. Diego

DEPTH IN FEET	WELL CONSTRUCTION	WELL NOTES	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		Flush well guard well casing Top of well screen. 0.8' Bottom of well - 3.8'		Black top over brown sand fill over gray silt-clay 0 PPM
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

WELL LOG

PROJECT NAME: Lackard's Mobil
LOCATION: Middlebury, VT
DATE DRILLED: August 20, 1992
TOTAL DEPTH OF HOLE: 4 feet
SCREEN DIA.: 1.5 inch LENGTH: 3.0'
CASING DIA.: 1.5 inch LENGTH: 1.0'
DRILLING CO.: Adams Engineering
DRILLER: Gerry Adams

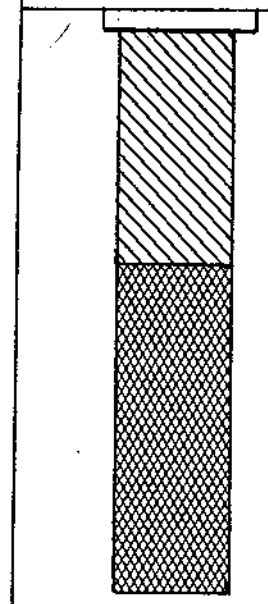
WELL NO: MW-2
PROJECT NO.: 93-006
DRILL DIA.: 2.375
SLOT SIZE: 0.006"
TYPE: PVC
DRILLING METHOD: Vibrating Core
LOGGED BY: J. Diego

DEPTH IN FEET	WELL CONSTRUCTION	WELL NOTES	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		flush well guard Well Casing Top of Screen at 1.0' Bottom of Well at 4.0'		Black Top over sand fill over damp, silt-clay over tree stump 0 ppm
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

WELL LOG

PROJECT NAME: Lackard's Mobil
LOCATION: Middlebury, Vermont
DATE DRILLED: February 11, 1993
TOTAL DEPTH OF HOLE: 9.6'
SCREEN DIA.: 2 inch LENGTH:
CASING DIA.: 2 inch LENGTH:
DRILLING CO.: Adams Engineering
DRILLER: Geery Adams

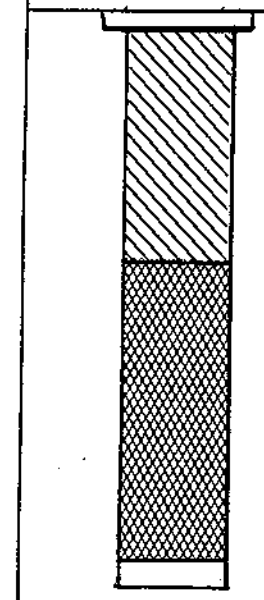
WELL NO.: MW-3
PROJECT NO.: 96-006
DRILL DIA.: 4inch
SLOT SIZE: 0.010 inch
TYPE: PVC
DRILLING METHOD:
LOGGED BY: Diego

DEPTH IN FEET	WELL CONSTRUCTION	WELL NOTES	PID READINGS	SOIL DESCRIPTION AND NOTES
0		Flush Mounted Well Gauro		
1				Blacktop over Sand and Gravel fill
2		Well Casing		
3			30 PPM	Stiff Brown Silt Clay
4		Top of Well Screen at 4.4'		
5				
6			5 PPM determined by Headspace	
7				
8				Rock
9		Bottom of Well 9.6'		
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

WELL LOG

PROJECT NAME: Lackard's Mobil
LOCATION: Middlebury, Vermont
DATE DRILLED: February 11, 1993
TOTAL DEPTH OF HOLE: 9.4'
SCREEN DIA.: 2 inch LENGTH: 4.8'
CASING DIA.: 2 inch LENGTH: 3.9'
DRILLING CO.: Adams Engineering
DRILLER: Geery Adams

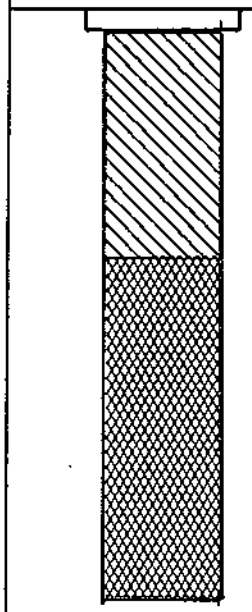
WELL NO.: MW-4
PROJECT NO.: 93-006
DRILL DIA.: 4 inch
SLOT SIZE: 0.010 inch
TYPE: PVC
DRILLING METHOD:
LOGGED BY: Diego

DEPTH IN FEET	WELL CONSTRUCTION	WELL NOTES	PID READINGS	SOIL DESCRIPTION AND NOTES
0		Flush Mounted Well Gaurd Well Casing	NOT DETECTED	Topsoil over Rubble
1				
2				
3		Top of Well Screen at 4.1'		
4				
5				Stiff Brown Silt and Clay
6				
7				
8		Bottom of Well Screen at 8.9'		Light Brown dry Silty Sand w/ Few Stones.
9				
10		Bottom of Well at 9.4'		
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

TSEC
WELL LOG

PROJECT NAME: LACKARDS MOBIL
LOCATION: MIDDLEBURY, VERMONT
DATE DRILLED: FEBRUARY 11, 1993
TOTAL DEPTH OF HOLE: 9.2'
SCREEN DIA.: 2 INCH LENGTH: 4.8'
CASING DIA.: 2 INCH LENGTH: 3.6'
DRILLING CO.: ADAMS ENGINEERING
DRILLER: GERRY ADAMS

WELL NO.: MW-5
PROJECT NO.: 93-006
DRILL DIA.: 4 INCH
SLOT SIZE: 0.010 INCH
TYPE: PVC
DRILLING METHOD:
LOGGED BY: DIEGO

DEPTH IN FEET	WELL CONSTRUCTION	WELL NOTES	PID Readings	SOIL DESCRIPTION AND NOTES
0		Flush Mounted Well Guard		
1				Black top over sand and gravel fill
2		Well Casing To 3.9'		
3				Stiff Brown Silt over Clay
4		Top of Well Screen at 3.9'	5 PPM (10 PPM determined by headspace)	
5				
6				
7				
8				
9		Bottom of Well 9.2'		
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				